

Effort to restore endangered fiddleneck blossoms

Scientists in LLNL's Environmental Protection Department are working to restore populations of the critically endangered large-flowered fiddleneck (*Amsinckia grandiflora*), a plant on the brink of extinction.

The large flowered-fiddleneck is an annual plant that historically found in several grassland locations in the hills of eastern Contra Costa and Alameda counties and western San Joaquin County. There are currently only two known natural populations of the large-flowered fiddleneck. One population is located at Site 300 and another is located on a private ranch near Site 300 (referred to as the Carnegie Canyon population).

Researchers at Mills College began restoration of large-flowered fiddleneck populations in 1988. These efforts focused on determining the factors necessary for the establishment of additional populations of large-flowered fiddleneck, and have resulted in at least one successful experimental population at Lougher Ridge in Black Diamond Mines Regional Park near Antioch. Between 1993 and 1995, using funds obtained through the Laboratory's Directed Research and Development Program, LLNL researchers teamed with researchers from Mills College to further investigate the causes of the large-flowered fiddleneck's rarity and established an additional experimental population at Site 300 near the native Site 300 population. Ongoing efforts have been funded by grants from the U.S. Fish and Wildlife Service, the U.S. Bureau of Reclamation, and Site 300 management.

Large-flowered fiddleneck populations have been greatly diminished in recent years. Last spring the native Site 300 population contained only three large-



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flowered fiddleneck plants and has had less than 50 plants each year since 1999. These population numbers are down from the 1960s when thousands of plants of this species were found in the native Site 300 population. These population declines have also been observed in the native Carnegie Canyon population and the experimental populations at Lougher Ridge and Site 300.

In an effort to boost these populations, LLNL ecologists planted more than 6,000 large-flowered fiddleneck seeds at the Lougher Ridge and Site 300 experimental populations in the fall of 2002. A wet fall in 2002 followed by a dry winter resulted in poor success with the seeds planted in 2002. Because of this, seeding efforts were repeated in the fall of 2003 with more success and resulted in more than 700 large-flowered fiddleneck plants, which survived to flower in the spring of 2004 at each site.

LLNL scientists also continue to conduct research, initiated in 1993, at Site 300's experimental population to determine the ecological requirements of large-flowered fiddleneck. Long term research at the Site 300 experimental population, and data from management of the Site 300 natural population indicates that competition from exotic annual grasses contributes to the decline of large-flowered fiddleneck. Long term management to reduce exotic annual grass cover and restore and maintain the native perennial bunch grass community is necessary to ensure the persistence of this species.

Through these research and restoration activities, we hope to insure that the large-flowered fiddleneck populations can be sustained, and that this rare native plant continues to be one of the many things that make Site 300 a unique and interesting place.



DON GONZALEZ, LLNL



Left: Although the large-flowered fiddleneck, *Amsinckia grandiflora*, is rare, other species in the fiddleneck genus (*Amsinckia*) are quite common. **Upper right:** The small burned plots are part of an ongoing experiment to determine the effect of prescribed burns on large-flowered fiddleneck success. **Lower right:** Ecologists from LLNL's Environmental Protection Department plant large-flowered fiddleneck seeds using frames to assist with precision placement and spacing of the seeds.